Visions of Research in Music Education

Volume 11 Article 7

2008

The Generative Theory of Musical Learning Part I: Introduction

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General Music Today

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by Eunice Boardman

Based on an address presented at the Music Educators National Conference National In-Service Conference, Indianapolis, April 20–23, 1988

A theory of musical instruction cannot be based solely on a theory of learning. Because instruction is concerned with helping an individual – the learner – gain knowledge of a subject matter (in our case, music) within an institutional setting (the school), our instructional decisions are, must be, founded in underlying assumptions about music and about the purpose of schooling, as well as in a well-founded understanding of how people learn. Only to the extent that these sets of assumptions function "in tandem" can a convincing theory of instruction emerge. Because the generative theory of instruction is so firmly based in a particular set of underlying assumptions out of which emerge guidelines for classroom practice, this paper is organized in three sections. The first will deal briefly with the origin of the underlying assumptions in contemporary philosophical and psychological theories; the second will describe the influence of these assumptions on the development of a specific theory of music instruction. The final section will illustrate how this theory is implemented when planning for specific classroom experiences.

The underlying propositions that shape the theory to be discussed in this article are founded in a significantly different set of assumptions from those which have shaped the way we identified and solved problems for most of the past two centuries (See NOTE, end of article) . Since the time of Newton and his presentation of the theory of logical causality, certain premises have pervaded all areas of human exploration, knowledge gathering, and rule making, including the development of theories of music learning and instruction. Among the basic assumptions embedded in the *mechanistic world view* established by Newton's theory of logical causality was, first, the doctrine of *reductionism.* Everything – objects, events, properties and our experience of them – consists of elements, of individual parts that combine one-directionally to form a hierarchy.

Such an assumption leads automat-

ically to a second basic principle, that the prime mode of problem solving is *analytical thinking*: to understand anything we must dissect it until the ultimate atom is identified. By then explaining the properties and behaviors of each of these atomistic parts, an understanding of the world is gained. Such analysis gives rise to the third basic assumption of the mechanistic world view: All phenomena can be explained by identifying *cause and effect* relationships; a specific cause, and only a specific cause, can produce a specific result.

Whether concerned with physical, psychological, philosophical or social aspects of knowledge, the application of these underlying assumptions led us constantly toward the search for the ultimate element, the indivisible atom.

There is no question that the Industrial Age, the final gem in the crown of the mechanistic world view, was literally "earth shaping," as principles of reductionism, analysis, and cause-effect relationships were applied to the development of machines that could replace physical work. However, beginning with the late nineteenth century, the seeds of a new world view, and thereby a new set of underlying assumptions, were sown when inventors began to turn their attention away from machines that could supplant man's physical work and toward the development of devices that dealt first with the transmission and ultimately with the manipulation and creation of symbols. Such a shift in the purpose of the machine requires completely different conceptions. In opposition to doctrines of reductionism and analytical modes of thought, theories of expansionism and process that are synergetic, that is, which recognize that a system, while it may be possible to identify components within it, is a whole that is larger than and different from simply a compilation of individual entities into an aggregate. This postulate is rooted in the recognition that system components are not only interactive but interdependent. This new world view recognizes that the nature of reality, and our perception of that reality, is not to be found in the dissection of physical materials but in the construction of symbolic systems.

Because those of us in education are also products of our world, our instructional theories have been reductionist, analytical and linear. Mechanistic principles have controlled curriculum construction, testing, text writing and instructional methodology for the past century. However, if we are to be responsive to the needs of the information society of the late twentieth century, we must begin to build instructional theories that reflect the assumptions which control this new world view and translate those views into curricula, texts, methodologies and evaluative devices. Otherwise we, like the dinosaur, the horsedrawn plow, and the quill pen, will become merely nostalgic objects of curiosity, if we do not disappear altogether!

It is within the framework of this emergent age that I would like to offer, first, some basic assumptions about music, schooling, and learning and, second, demonstrate how these underlying principles have shaped the generative theory of music learning and instruction.

Basic Assumptions of the Generative Theory

Among the basic assumptions of this emerging world view that have particular significance for instruction is recognition that:

(1) The basic unit is a system, of which the whole is greater than the part,

(2) Symbols and symbol systems not only serve to represent our view of reality, but mould that view,

(3) The purpose of knowledge is generative – to make possible the expansion of not just one's personal grasp of existing information but the total body of possible knowledge.

Applying these assumptions to education and instruction makes possible the development of a set of axioms that have guided the construction of the generative theory of music learning and instruction. The first of these recognizes that:

The ability to create symbol systems is a fundamentally human trait; thus, introducing the young to the symbol systems of the society is a basic role of education.

From the recognition that symbol making is a fundamental human process grows a second assumption:

Music is a symbolic system, and therefore the study of music is an essential part of the education of the young.

The rationale for these two basic axioms is based on the writings of, among others, Nelson Goodman, Charles W. Morris, Suzanne Langer, and Howard Gardner. This article is not the place for a thorough discussion of their persuasive arguments except to point out some significant aspects of their theses. First, the ability to symbolize means to be able to use an element to represent *something other than itself.* Second, the term "symbol" implies a "system" for representation: individual sounds, or isolated squiggles are not in and of themselves symbols. Each discrete element is of value and possesses potential for meaning only as a result of its relationship to the total system.

Third, while we sometimes refer to music as though it were concrete, existing, like a bush or a bird, in the physical world, knowledge of which is acquired through the aural sense, music is not sound in the sense that a rock is matter. Musical sound is the *symbolic representation of cognitive and emotional activity*, just as language is the symbolic representation of other forms of cognition and emotion. Furthermore, since music is a symbolic system, it exists only as a synergism, a whole that is larger than its parts.

Fourth, the premise of music as a symbol system is proposed because such a system enables humans to symbolically incarnate concepts which no other symbol system has the power to represent. It does indeed "express the inexpressible."

Finally, this set of assumptions acknowledges the "universality" of music based on acceptance of the previously-stated view that the ability to symbolize is a basic human characteristic; as such, the ability to engage in the symbolic activity called music is universal. The basis for this view of music, and consideration of its implications for understanding the act of music-making, hearing, or creating, comes not only from those philosophers and psychologists concerned with symbols as a human activity; researchers and theorists in other fields of inquiry also provide support for the propositions offered here.

Music psychologists are among

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those who have also begun to recognize that reductionist attempts to measure musical perception by testing responses to the "musical atom" – an isolated pattern of two or three pitches, two or three chords or a few durations – does not provide information about musicality, about how people actually interact with music. A stream of sounds can only be defined as music if it functions as a symbolic whole; therefore insight into musicality will not be gained through behavioristically based research. Psychologists interested in the phenomenon of music are recognizing that such behavioristic studies provide no information about subject's responses to a musical whole. Conclusions based on response to discrete "sound objects" do not provide a basis for understanding how people interact with music–the symbolic whole. As a result of this belated recognition of the holistic nature of music, contemporary researchers are attempting to develop research designs that will, it is hoped, reveal information about musical responses rather than responses to elements of sound. While definitive research is not yet available, between the lines of innumerable research studies one must inevitably draw the conclusion that, while the trained musician may be more adept at identifying and labeling discrete atoms of sound, a linear cause-effect relationship between that skill and the kind of musicality which we all (layman and professional alike) recognize when hearing a musical performance is impossible to prove.

Music is not hierarchal, a building up of one element of sound upon another. It is not an eclectic selection of pitches, duration, and timbres. It *is* a synergism where the whole is far more than its discrete parts.

Music theorists, whose heritage has also been highly mechanistic and reductionist, are also beginning to recognize that extracting the smallest components from a composition may tell us something about how pitches are organized but gives us very little information about how music functions holistically and symbolically. Music is not hierarchal, a building up of one element of sound upon another. It is not a eclectic selection of pitches, durations, and timbres. It *is* a synergism where the whole is far more than its discrete parts. The moment a part – a pitch, a pattern, a phrase – is withdrawn from the whole, that pitch, pattern, phrase (as well as that which "remains") has lost its value, changed its identity. Let us look for a moment at the ubiquitous falling minor third, specifically as it relates to music of the western world. To begin, within the major scale (another mythological "building block" in the reductionist view of music) there is not "the" minor third but three: between scale degrees 1'-6, 5-3, 4-2. Add to that the fact that, in the next most common scale defined as the basis for melody, the natural minor scale, those three minor thirds have now become four, existing between scale degrees 7-5, 6-4, 4-2 and 3-1. Any theorist who suggests that those several intervals, all labeled with a single descriptor–"the minor third," can/should be performed in the same way, are perceived by the listener as identical, or conceived interchangeably by the composer would have to be questioned as to his skill as a theorist. To identify "the" minor third as a "category of one" is to ignore, first, the relationship of this simple little "atom" to the underlying harmony (5-3 can, for example, be the second and third tones of the I chord, the first and second tones of the III chord or the third and fourth tones of a VI^7 chord, to say nothing of its contribution to the harmonic ambiance as well as the melodic flow when one of the tones serves as a passing tone). The interval's placement in the phrase; its relationship to the underlying pulse; the relative duration of the two pitches to each other and to other pitches within the stream–all will, must influence the performance, the listener's response and the compositional choice of "the" minor third. (And that is to say nothing of the effect of intensity, articulation, texture and timbre.) Other examples of the futility of mechanistic-based theories of musical analysis could be offered, but, because the minor third plays such an important role in many theories of music instruction, let it suffice as an example of the need for non-mechanistic theories of musical analysis as well as new theories of the psychological nature of musical response.

What does all this have to do with a theory of music learning and instruction? A theory of music learning must take into account the increasing evidence that musical comprehension and the consequent skill to demonstrate that comprehension through overt musical behaviors is a

function of recognizing, first, that music is symbolic of concepts – ideas, emotions conceived in the human mind – and second, that musical sound can serve in that symbolic role only if one is dealing with a musical whole.

To continue to argue that the learning of music is best achieved through serially-based reductionist processes of identifying and rehearsing segregated fragments that may be eventually combined into a chain of disjunct links which is then called music is to remain blind and deaf to the recognition that music serves its purpose only to the extent that it is recognized as a symbol, and thereby as a product of cognition (whether the individual involved in the cognitive act is behaving as a performer, listener or creator).

The premise that the whole is not a hierarchy or a linearly-connected compilation of parts but an integrated system in which the whole is far greater than the parts is, to me, the most significant of the assumptions of the new world view and the one that is the most far-reaching as outdated mechanistic principles are replaced. The proposition that the essential unit is a system is proposed by theorists in fields as far apart as biology, economics, and artificial intelligence. All hold in common the recognition that a system is a network which processes information in both the linear and nonlinear, or intuitive, modes. The optimum system is a dynamic interplay of its component parts.

Such a view of the world is in strong contrast to previously prevailing reductionist views. Behaviorist interpreters of mechanism sought to reduce the individual to a single indivisible particle–the body and its observable operations or "behaviors," a structure based purely on linear causes and effects; a structure in which emotions, feelings, and cognitive processes were considered either non-existent or irrelevant. Such a view is self-defeating in a world that recognizes the human being as a highly complex "system," for endemic to the definition of "system" is the interdependent nature of all potentially extractable components.

For educators, the significance of this conclusion lies in recognizing that a human interacts with the environment as a holistic agent in which cognitive, emotional, and actional processes are indivisibly intertwined. As Bruner points out, "Experience is not 'theory-independent'. There is no seeing without looking, no hearing without listening, and both looking and listening are shaped by expectancy, stance and intention." Emotions, cognitions and actions do not function each in isolation but are aspects of a larger whole that achieves its integration only within a cultural system. Emotion is not usefully isolated from the knowledge of the situation that arouses it. Cognition is not a form of pure knowing to which emotion is added. And action is a final common path based on what one knows and feels. (Bruner, 1986). Thus, a second axiom emerges:

A theory of learning must encompass recognition of the interdependence of action, emotion and cognition.

Applied to music instruction we must recognize that (1) successful engagement in a musical action (behavior) is dependent upon possession of appropriate knowledge gained through relevant cognitive processes, (2) the nature of the musical knowledge acquired is a function of the emotional state, and (3) to suggest that emotional response to music (including the aesthetic component of that response) is attainable without cognitive involvement is to relegate the aesthetic aspect of experience to the lowest level of sensual satisfaction.

To develop the basis for the third axiom of the generative theory of music learning and instruction one must turn to the studies of anthropologists and educators, particularly those concerned with curriculum. The business of education is also a network, a system which consists of all members of a culture which are concerned with instructing the young: the school, the family, social organizations such as the church, to name just a few. Study of the interaction of these institutions forces us to recognize the social nature of learning. We are compelled to realize that not only *what* is learned is culturally determined, but *how* and to a large extent *when*. Infant studies, studies of primitive societies, and studies of the interaction of members of our own culture reveal how pervasive within a society are the expectations and limitations as to what *should* and *can* be learned, not just in terms of acceptable behaviors or values, but even the kinds of cognitive processes. The conclusion that cognitive abilities are socially transmitted, socially constrained, socially nurtured and encouraged has been supported by research in a variety of domains.

If this is true, then the particular task of the school within the total educational network is (and has been in the past, perhaps without conscious awareness) to devise a curriculum that specifies the sequential development of the socially approved behaviors, values, and cognitive skills.

Of the institutions that are concerned with education within a particular culture, the formal education segment of the web, the school has traditionally been assigned the task of ensuring that certain cognitive skills, values (including the aesthetic) and actions which the society deems essential are conveyed to the next generation. Which of these are selected to be assigned to the school is directly related to the society's assessment of their importance and its perception of whether other institutions (including the family) are effectively discharging the task of transmission of a particular aspect. (This may well be at the root of many of the recent claims that schools are failing. The constantly expanding view on the part of society as to which aspects of the culture must be transmitted through the schools, from understanding the danger of drugs to teaching students manners, non-religious values, etc., has placed such a burden on the school that it may have become "overloaded" and hence programmed for failure.)

In other words, the school's role is basically one of introducing the young to *alternative* ways of adapting to, controlling, or altering their environment (whether that environment be physical, social, economic, or personal) which they might not otherwise discover. The term "alternative" is a crucial one. Even in today's complex society, an individual can survive, although the quality of that survival may be minimal, without formal schooling, the requisite that schools provide "alternative" ways is the part of the assignment which requires us to examine the social milieu in which we as teachers are functioning and select

those aspects which society continues to consider important but does not convey by other means. The transmission of these skills, processes, and values then becomes the task of the school and leads us to our third axiom:

The role of the school is to transmit those aspects of the culture which the society has deemed essential and for which no other institutions provide.

Translated to music education this means that our responsibility is to help youth extend their ability to function as musical persons, as performers, listeners (describers), and creators while recognizing that there are many aspects of these skills that continue to be transmitted through other segments of society. We all know hundreds of teenagers who may be able to perform on sticks and bottles, guitars or electronic keyboards, who may respond to music of their particular culture with a high degree of sophistication, who may even use their performance skills in improvisatory, creative ways. What they may not have is an opportunity to learn such skills as notation, how to perform on a wider variety of instruments, how to communicate their ideas verbally or through a compositional structure. What they probably do not have is access to a wide variety of music from many eras, idioms, and cultures. As music educators our task is not to duplicate or replicate what the young person can acquire through non-school avenues, but to provide alternatives, to help that individual expand his or her awareness of how music can enrich one's life.

If these assumptions are accepted, then it becomes my task, as the teacher, to consider the implications of each as I initiate the planning process and subsequently implement that plan within the classroom. Each decision I make, from defining my objective to developing an instructional sequence, must be based in my understanding of the ramifications of these assumptions for instruction.

Having established the fundamental assumptions which provide the basis for instructional decisions, we are ready to turn our attention to the construction of a theory of musical learning, its implications for instruction and a consideration of how the fundamental assumptions influence these decisions. The generative theory presented here is also based on forty years of observational research. Little of what is offered here is based on the results of specific experimental research. Research based on the examination of responses to sound offers us little, if any, knowledge about responses to *music*. Until music psychologists and music education researchers develop experimental designs which investigate ways individuals interact with the musical whole, observational, ethnographic research will have to continue to be our prime source of guidance for instructional decisions.

The first instructional decision I must make as a teacher is to define what I mean by learning, for how I interpret the meaning of that term will influence all subsequent decisions.

The first object of any act of learning–is that it should serve us in the future. Learning should not only take us somewhere; it should allow us later to go further more easily. (Bruner, 1961)

I find this statement as vital and as electrifying in its potential implications for instruction as I did when I first read it more than twenty-five years ago. The purpose of learning is not to acquire a specific skill, or a body of facts, or even a particular value, but to generate more learning, to enable the learner to continue to learn until the end of his days. Such a definition is sympathetic with the third axiom presented earlier: that the role of schooling is to provide alternatives. Recognizing that learning, and thereby schooling, should help an individual "learn how to learn" ensures that the individual will be able to continue to find alternative ways of adapting to or controlling his/her environment long after formal schooling has ended.

It is from the recognition of this generative nature of learning that the label for the theory herein described is drawn. It speaks not only to the child's growth and development but to the teacher's as well. The greatest power of the "generative approach" is that its continually evolving nature allows me, the teacher, to also continue to learn, to take advantage of new information while the underlying assumptions still provide me with a means of evaluating each idea before I blindly accept it just because it's new. (See footnote B.)

If the purpose of learning is to generate more learning, to allow the learner to go further, faster, then the definition of learning must be: *moving from a known through an unknown to a new known.*

Such a definition will control decisions as I plan instructional sequences, for it reminds me that I must begin each lesson with familiar tasks, move gradually into the unfamiliar and then onward until the unknown becomes a new known, which in turn provides the threshold of familiarity from which further excursions into the unknown may be launched.

Theoretical basis for this interpretation of learning comes from, among others, Piaget's theories of assimilation and accommodation. As the child encounters new experiences, the knowledge thus confronted is combined with existing knowledge, either through assimilation by combining the new with the existent–or accommodation–the restructuring of the known to account for new information.

Implicit also in the original proposition that the purpose of learning is

The learning environment must be a network in which all segments of the environment are intermeshed and interdependent.

generative is the recognition that:

The learner's goal is independence
therefore
the teacher's goal must be obsolescence.

The ultimate goal, as the learning sequence unfolds over a period of time will be, for the learner, to take control of one's own learning, to be able to structure one's own "environment for learning." The teacher must build into the instructional sequence opportunities for the learner to acquire procedures for learning–for, in fact, "learning how to learn." Basically, that is what instruction is all about: organizing an environment where learning can take place and where learning how to learn also occurs; where initial experiences may be largely controlled by the teacher, but where gradually the decisions for organizing that environment are transferred to the learner. The independence on the part of a first grader may simple be the ability to accurately sing a song alone, once teacher has established tonality, meter and tempo. The third grader may demonstrate ability to set the tempo of a familiar song for the class. The fifth grader will further demonstrate independence when the class performs familiar songs by serving as the leader, establishing the tonality and tempo on an Autoharp or other pitched instrument, and signalling the class when to begin to sing. And, of course, our goal is that the sixth or seventh grader has become independent enough to have learned the song independently, from the notated score.

To ensure that we are organizing an optimal environment for learning, we must organize a setting that embraces the proposition that such a setting is also a holistic system, as discussed in the opening section of this paper. The learning environment must be a network in which all segments of the environment are intermeshed and interdependent. The generative theory proposes a learning environment which consists of six components. Decisions about how each interacts with the other must be made as the teacher plans that environment. These components include: the content, the context, the behavior, the mode of knowledge representation, the cognitive strategy and the attitudinal climate. The **content** (that which is to be learned) is embodied in a **context** (the musical example) with which the learner will interact during the act of learning. That interaction will involve some sort of **behavior**; the choice will be influenced by the **mode of knowledge representation** at which the learner is currently functioning. All of these interactions determine, while concurrently being guided by, the **cognitive strategy** needed to move from the known–through the unknown–to a new known. Finally, decisions made about each of these components will be motivated by what I choose to call, for want of a better term, the attitudinal climate–those aspects of the learning situation susceptible to individual emotions, feelings and values, including the aesthetic.

While each of these components can be extracted from the whole, and considered separately, it is essential to keep in mind that these components form a cohesive totality which forms a mosaic in which each makes an indispensable contribution to the total experience while simultaneously being influenced by the others. It is the integration of these components into a holistic learning environment, much greater than any single part, that makes it possible for learning to occur. Within such an environment the child will be able to integrate new experiences into an existing schemata, allowing him/her to accommodate and/or assimilate as required.

(The second section of this paper will examine each of the six components in greater detail, considering how decisions made about each component are influenced by the underlying assumptions presented in this section. The final section will illustrate the implementation of the theory through examples of lesson plans which reflect the synergetic nature of the theory and briefly outline the long-range implications of the theory for the teaching of the specific musical elements of rhythm and melody.)

NOTE A: Following is a selected bibliography of books and articles which have influenced my thinking over the past thirty years. While it is often difficult to make specific references within the body of the paper, it is hoped that, for those interested in pursuing the origin of the generative approach, the readings will be as provocative as they have been for me.

NOTE B: In addition to the readings that have influenced me, there are many individuals who have also participated, sometimes without realizing it, in the generation of this approach. This article is written by me "on behalf" of the colleagues who have taught me and whose contributions to this system have allowed it to be truly a network of ideas: from James Mursell and Charles Leonhard and Howard Ellis and Betty Welsbacher and Barbara Andress and Fred Willman and Mary Pautz and so many others: Lilla Belle Pitts, Beatrice Krone, Marion Marr, Mary Hoffman–and all the students with whom I've been privileged to share music and music learning ideas! From each has come some element of what today is called the generative

approach. It may be eclectic, in that, as already observed, the network of ideas have interjected themselves from many sources; but it goes beyond eclecticism to synergism, for the whole is indeed far greater than its parts.

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This well may be a model for similar programs in similar-type settings. More and more retirement manors are being established around the country with a clientele which is retired but *active*. As the Claremont Manor POLAR motto states: "As long as you keep on learning, you will never know an empty day."

Readers are invited to share ideas, experiences, comments, and questions.

Send "Lifelong Learning" contributions to:
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The Generative Theory of Musical Learning, Part II

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Based on an address presented at the Music Educators National Conference National In-Service Conference, Indianapolis, April 20–23, 1988. Part I appeared in the Fall issue; Part III, in the next issue, will present examples of specific instructional applications of the generative theory.

Four fundamental premises were proposed in the opening section of this paper: that music is a unique symbol system, that cognitive, emotional and behavioral qualities of the individual are interdependent and interactive, that the role of schooling is to provide the individual with alternative ways of interacting with his or her environment, and that the purpose of learning is to serve us in the future. Drawing on these assumptions for guidance, the generative theory of music instruction consists of a six-component system: content, context, behavior, mode of knowledge representation, cognitive strategy, and attitudinal climate. The integration and interaction of these six components into a network provides an environment for children to grow in their understanding of music. As noted at the close of Part I, as each of these elements is examined in greater detail, it is essential to keep in mind that it is the integration of these components into a holistic learning environment, much greater than any single part, that makes it possible for successful learning to occur.

Content

All theories of instruction and curriculum begin with a definition of what constitutes content, that which is to be learned, the "residue of learning." The generative theory of musical learning is based on the premise that what one learns are concepts, mental structures which, in combination, form the structure of the subject matter we call "music." This choice of definition acknowledges that the process of conceptualization is in itself generative, because conceptual knowledge, by its very nature, allows for learning in the future. Simple, concrete concepts form the basis for more complex, abstract concepts. Concepts which are holistic, representing large classes of experiences, are gradually refined as con-

A conceptually based instructional approach will recognize that musical concepts

cepts related to the parts of that whole are acquired.

The definition of musical learning as basically conceptual has been a popular one in music education since the early sixties. While recognizing that disagreements as to exactly what constitutes a musical concept still exist and that no single definitive list of musical concepts has emerged, the following discussion of the content component of the learning environment will be based on commonly accepted musical concept definitions.[1]

If we accept the first premise presented in the introductory section of this paper, that music is a symbolic representation of cognitive and emotional processes with the subsequent recognition that music exists as a totality moving through time, then in one sense there is only a single concept, that of "music." Certainly that fundamental concept does exist and is grasped early in one's experience; very young children demonstrate that they have conceptualized the difference between sound streams that are music and those that are not. Beyond this initial and most fundamental of concepts, others which are essential to complete musical understanding are also formed through experiences with the musical whole rather than through discrimination of individual elements. Such concepts include those commonly labelled as form, style, and expressive whole. For each of these, apprehension of the musical whole is essential in order to grasp the concept. Music as an expressive whole is perhaps the most pervasive, for it reflects the first assumption of the generative approach: that music expresses (symbolizes) the otherwise inexpressible.

The second holistic concept is that of style – comprehension of music as reflective of "time and place." As suggested earlier, music is universal in the sense that the symbol system we call music does occur in all cultures. However, just as has been the case with other symbol systems such as language, each culture has developed its own unique way of representing meaning. It is the uniqueness of this representation that we define as "style." That such a concept does exist is readily evident in the fact that even the most musically unsophisticated member of a culture possesses the ability to recognize music of his or her own culture, as distinguished from music of other cultures (Serafine 1988).

A third concept which is dependent upon response to the musical whole is that of form. As with style, observation of the untutored convinces us that awareness of musical structure does exist as a fundamental musical concept. Research suggests (ibid) that there are certain generic cognitive processes which seem to be present in people of various cultural backgrounds. Regardless of the stylistic constructs which define the form, most people recognize that music is marked by temporary resting points, that musical material may be transformed or changed, and that there is such a thing as "coherent, organized, memorable" musical line.

The attributes of each of these fundamental concepts reflect the unique manner in which musical elements are organized within the musical whole. Specific, supportive concepts of discrete musical elements are also formed as individuals acquire the ability to extract elements from the total sound stream. Concepts of musical elements include those related to timbre, articulation, dynamics, rhythm, melody, and harmony or texture. Certainly at some point in the child's musical maturation, the ability to separate subsidiary qualities from the musical whole does indeed seem to operate.

Acceptance of this, or a similar, body of concepts as the musical content to be learned has crucial implications for the way in which a theory of instruction will be implemented:

1. If this body of concepts is fundamental to musical understanding, then opportunities to gain all musical concepts must be provided within the instructional approach. A theory of musical learning which focuses on only some concepts to the neglect of others cannot be viewed as a viable theory on which to base an instructional approach.

2. A conceptually based instructional approach will recognize that musical concepts can be gained only when the learner is interacting with the musical whole. Focus on isolated fragments of sound will not provide children with opportunities to internalize concepts of musical structure.

In the generative approach there is no time for drill on discrete rhythmic or melodic patterns. The children will always be responding to a musical whole. This is not to say that, at some point in the learning process, abstraction of a part will not occur; but the purpose of such abstraction will always be to determine the relationship of that part to the whole – how it influences, and is influenced by, other parts of the whole.

3. Not only must the recognition of the multiplicity of concepts function when planning long range curricular goals, but it also must be acknowledged when planning a single lesson. I may say to the class, "Listen for this rhythm pattern," but I must be aware of and provide within my instructional plan for the fact that each child will be attending to that pattern within the context of the musical whole and thereby may perceive it differently from the way I have anticipated.

Context

Conceptualization occurs as a result of interaction with something which "embodies" the concept, an example which can be observed through sensory experiences. Therefore a second component of our learning environment is that of content. Since the concepts we seek to help children gain are musical concepts, that context will always be music. Criteria for selection of the context, the musical example,

an be gained only when the learner is interacting with the musical whole.

will once again reflect our awareness of the symbiotic relation of the components to our underlying assumptions.

1. Aesthetic value. The first criterion, as we select a particular piece of music, must be in terms of its musical value as symbolic of feelings and ideas, its potential for aesthetic experience. This criterion recognizes that, within our genre, some music is "better" in that it has greater musical value than others, whether it be children's songs, worksongs, rock, or "classical" music. Selection based on aesthetic potential also means, of course, that many compositions which we may have included in the past will be eliminated. It's impossible to find space in a generative classroom for songs composed to teach the quarter note, to remind students not to cross the street against the red light, or to explain how to tie their shoes. There will be no space for the latest "Top-Forty Hit" just because you promised it as a "treat" if the kids were good in music class.

2. Representative of diverse cultures and eras. In recognition of the universality of music and of our charge to introduce children to alternatives, our context must include examples from many periods and many cultures. At the same time, we must recognize the premise stated earlier, that learning always begins with the familiar. Examples initially will be drawn from the repertoire most stylistically similar to that the child has already encountered, interspersed with examples that are less familiar but have some congruent characteristics. To implement this recommendation we must carefully examine the stylistic concepts children bring to school. In late twentieth century America, even among minority ethnic groups, these concepts are less likely to be based on the simple jump rope rhymes, action songs, and the three-pitch tunes we like to think are already part of the child's repertoire than they are to be drawn from commercial music heard on television and radio.

In selecting music of varied cultures we must also remember that, just as we don't expect most of our students to ever perform in a symphony orchestra or take part in a major opera, but introduce this repertoire to them so they may become intelligent audiences, so should much of the music of other cultures be presented as listening experiences. To be performed authentically, much music of other cultures requires subtle concepts of performance practice that most of us do not possess. Rather than presenting "watered down" versions of such music, we are more likely to achieve our goal of appreciation of music of other cultures if we help children enjoy such music through listening and responding. Through a process of discovery we can help them gain a basis for cultural understanding that may go far beyond simple awareness of differences in musical style.

3. Drawn from a variety of genre. Selection of the context must also provide for introduction to a variety of media and genre. Children's classroom music experience must not be limited to only those musical examples which they can currently perform. Selections must also be drawn from the rich body of solo and ensemble literature (both vocal and instrumental) which are beyond children's current ability to perform and may remain so through their life.

4. Appropriate for the learner. Recognizing that the learner is a human network of cognitive, emotional and actional ingredients, the influence of each must be considered when making the selection.

a. A child who, after experiencing a rich environment of complex music at home, in the church, and elsewhere, comes to a classroom focused on music that is sterile because it has been devised for non-musical or pedagogical purposes is not going to be emotionally motivated to become involved in the music situation. The music *must* be meaningful to the child emotionally. This, however, does not mean selecting songs by the calendar or because fifth graders are "into" *Star Wars*. The musical content must be accessible to the child with the aesthetic potential at his or her level of emotional development.
b. Just as the music must possess meaningful emotional content appropriate to the child's age and experience, it must also carry appropriate cognitive content. If the focus of our lesson is to abstract a particular element, the musical example must be unambiguous, the clearest example possible at the learner's present level of conceptualization.
c. Finally, the music must be selected with the child's current psychomotor development in mind. Such basic things as appropriate range and rhythmic complexity must be considered if we expect children to perform a song. A "comfortable" tempo must be selected if we expect them to "describe" the rhythmic flow with movement.

When we have selected our context in relation to these criteria, the potential for meaningful learning will exist. If any one of these criteria – emotionally meaningful, cognitively unambiguous, with realistic psychomotor demands – are ignored, the lesson may well be doomed to failure before it starts. So often a teacher's criterion is "Will the kids like this song?" and certainly that's what I'm saying too; but in answering that question one must be sure of what "liking" involves!

Behavior

As we've examined the first two components, the content and the context, frequent reference has been made to the child as an actively knowing person who learns by engaging in some type of action or behavior. That is the third component to be considered: the overt acts the learner exe-

cutes as the links in the learning chain (known-unknown-known) are joined. The definition of musical behavior used by the generative approach is based on that developed by members of the Contemporary Music Project. They identified three categories of musical behaviors: performing, describing, and organizing (creating). These are the three primary ways an individual may "behave" musically. Regardless of level of expertise, the kindergarten child, the rock star, the Metropolitan Opera diva, the music critic, or the avant garde composer are all functioning musically as performers, describers, or creators. Performers produce musical sounds by singing or playing an instrument (including one's body). Describers may communicate their response to music performed by others through movement, visually (such as with the use of abstract designs), or verbally. Creators of music may improvise or compose.

As noted when discussing the "content" component, achievement of specific musical skills or behaviors, such as mastering appropriate fingerings on a recorder, strumming patterns on an autoharp, or even singing in tune, are *not* seen as the content or the lesson objective of the generative approach. Such skills are *means* to the end – the acquisition of concepts. This is not to suggest that the ability to "behave" as musicians by playing the recorder, accompanying a song on the autoharp, performing on mallet instruments, or singing accurately is not considered important. It is through the execution of these behaviors that the child gains, and reveals, understanding of essential concepts. It is the manner in which children are helped to acquire such behaviors that makes the difference. Is each behavior taught as a discrete skill or as a means of better communicating one's musical idea? In the past, when implementing methodologies whose origin can be traced to the mechanistic world view, teachers sought to break the performance act down to the smallest possible component, beginning with focus on the production of a single tone, a specific fingering, or a particular way to hold a mallet. Such methods grew out of the body of behavioristic research focused on analysis of responses to or production of fragments of sound, not musical wholes. To assume that introduction based on the conclusions offered by such non-musically based research will provide helpful guidelines for helping children learn to sing, to play an instrument, to compose, or to listen with intelligence is to make a leap of faith that I am not prepared to make. It defines the body of more recent research, referred to earlier, by gestalt theorists and cognitive psychologists who recognize that learning moves from whole to part. Attention to details of particular psychomotor acts comes late in the process, at the point in the child's musical development when he or she recognizes that, by engaging in "this kind of a psychomotor movement, rather than another" his or her personal goal of a musically satisfying performance will be more readily gained.

To give one example of the questionable value of instruction based on behavioristic research: There exists a plethora of studies (including my own) dating back more than sixty years related to the problem of helping young children learn to sing accurately. In spite of this, we still have no useful information that will allow me, the teacher, to construct a series of lessons which will ensure that every child will, indeed, learn to sing in tune. There are at least two reasons why this profusion of studies still provides us with minimal useful information. The first is that almost all focus on evaluating children's ability to reproduce sound fragments (the behavioristic atom) rather than on truly meaningful songs. Recommendations for training are then based on learning to accurately produce such fragments. However, there is no research which demonstrates that the ability to accurately reproduce discrete pitches or out-of-context patterns will automatically transfer to the ability to sing a complete song in tune. Second, I propose that most of the research is probably invalid because it measures only the child's ability to reproduce these patterns in a laboratory setting, with all of the artificial and therefore threatening characteristics of such a sterile environment. My personal observational research leads me to many of the same conclusions that I offered in my dissertation nearly thirty years ago. Children will learn to sing musically when

a. they are singing a meaningful musical whole.
b. they are in (and have been in) an environment where singing and other kinds of musical involvement are valued.
c. an emotional threshold of safety is present.
d. they possess the essential conceptual knowledge of musical structure.
e. they have acquired cognitive schemata which they can use as guides for producing the required action: "I must breathe, and use the breath to support the tone; I must open my mouth to allow the sound to emerge; I must be "aware" of the different actions I must engage in physically in order to produce a singing tone in contrast to a speaking quality; etc., etc." Effective schemata of course, are automatic; but eventually one is able to consciously analyze automatic schemata and verbalize the appropriate actional sequence. Young children aren't, of course, there yet; but that is the goal and frequently the mark of any skilled performer, whether in tennis, computer science, or music (Mandler 1985).

The same criteria hold true for the acquisition of other musical skills or behaviors. A child will learn skills when they are offered within a musical

(Continued on page 28)

(Continued from page 6)
context in a way that immediately demonstrates the applicability of the skill to the child's goal – to make music.

A final implication of this third component for instructional planning should be mentioned. The generative teacher must make sure that classroom activities offer a balanced experience, with opportunities for children to engage regularly in all three types of musical behavior. Such a balance is important because people are different in their learning styles and preferences. For some, performing is the most meaningful way to interact with music. For other children, however, responding to the music performed by others through movement, visual or verbal description, or by notating with musical symbols may be the most meaningful and the route through which they come to value music's contribution to their personal lives.

And for some children, more if we made sure that we included as many creative opportunities within the classroom as we did performing and describing, creating may be the most significant experience. One should keep in mind when planning creative activities that they must always be musically creative, involving musical sound. This is not to say that drawing a picture while listening to music or developing one's own interpretive movements to a beautiful composition may not be creative acts; but they are not musically creative. As a generative teacher, the only activities considered as musical creativity are improvisation and composition.

The incorporation of this component into the learning event requires careful thought as to the balance among, and the alternation between, various musical behaviors. And it is indeed possible to do, even within the constraints of a single lesson, through careful planning.

Mode of Knowledge Representation

Undoubtedly the most significant, because in many ways it is the most pervasive in its influence on the other components, is that identified as the "mode of knowledge representation." By this we mean the way an individual communicates understanding. In our verbal world it is easy for us to assume that the only way we can find out what someone else knows is by talking, by representing knowledge with verbal symbols. However, the theory of conceptualization upon which the generative approach is based recognizes that there are three basic modes of knowledge representation – three ways of communicating understanding. This theory, developed by Jerome Bruner, recognizes that an individual may represent knowledge enactively, iconically, or symbolically.

1. The first is mode is enactive and means, literally, to "act out." The individual represents his or her present knowledge by engaging in the appropriate action. My first grader "knows" beat, and I know she knows it, because she moves "in time" to the music she hears. She cannot tell me that she is moving to the beat, because the enactive mode of knowledge representation is nonverbal. Neither would she be able to respond correctly if I said to her, "Clap a steady beat" without providing her with a context (the sound of music) to which she could respond and a model (myself or another child) to observe in order to discover the appropriate action. The enactive learner demonstrates possession of a concept by acting out knowledge as long as the context is present and after having learned the appropriate act through observation of a mode.

2. The second stage is labelled iconic, implying "likeness." This is the stage of internalization. Individuals functioning in this mode of knowledge representation draw on mental imagery and communicate understanding by making use of types of representation that "look (sound/feel) like" the concept. Iconic learners will be able to describe what they hear in music with simple verbal imagery ("This music moves fast!") or visual imagery (by drawing a line that shows the up-down contour of a melody). Iconic learners can engage in the appropriate musical behavior even though the context is absent. This child can set up a steady beat on a drum to which other children might step, recall and accurately reproduce the contour of songs learned previously, or choose the icon that "looks like" the form of a composition being studied.

3. The third mode is that of the symbolic: something (an aural or visual representation) represents something else (an object, an idea, a feeling). Musical concepts are represented by two forms of symbol, verbal and notational. The child who has reached the symbolic mode of conceptualization will be able to respond to, and use correctly, traditional musical terminology ("The meter signature in this song is 2/4; it is in the key of C minor.") and be able to display, through appropriate behaviors, understanding of the concepts which are represented by such terminology. Similarly, the individual functioning at the symbolic mode of representation will be able to look at musical notation and turn it into sound – to sightread.

The recognition by Bruner that acquisition of a concept, and communication of one's acquisition, can be represented in ways other than verbally is the primary reason that this theory of concept development has been chosen as the basis for the generative theory of music learning. I am the first to admit that Bruner would probably not recognize his own theories in some of the applications that have been made to classroom music instruction! But its value has been in providing a model and some assumptions about concept

Without appropriate experiences, concepts will not be developed, or, equally important to keep in mind, false concepts may be acquired.

learning which allow for accommodation and/or assimilation as new information about concept learning is made available. And that is basically the value of any theoretical model.

There are three reasons why, of the many theories of concept development that have been proposed since the fifties, this still seems the most useful as a model for music learning:

1. Bruner's theory, while it implies stages, does recognize that all concepts are not necessarily represented in the same way. While concept acquisition is, in most theories, assumed to be achieved only when the ability to verbalize understanding can be demonstrated, Bruner recognizes that for some concepts there is no symbolic (in the common sense of the term as meaning verbal symbols) representation available. For me, this was most reassuring and provided the link between my acceptance of music as symbol, as being able to represent feelings and ideas for which there are no words (verbal symbols), and a theory of learning. Certainly every musician agrees that we have no visual symbolic representation for most of the characteristics of music. Beyond melody and rhythm, the symbols used by the composer to communicate intent are minimal if not non-existent. Bruner's theory makes it possible for us to be comfortable as musicians and teachers, accepting the knowledge that some musical concepts will never be communicated at the symbolic level if we are equating symbols with verbal and visual representations.

In another sense, we can also be comfortable with an interpretation of this theory that says, "Yes, people do reach the symbolic stage of musical conceptualization. This occurs when the individual can, for example, render a sensitive performance of a particular composition; respond on both cognitive and aesthetic levels to music heard, even though no overt behavior is observable; and communicate nonspeakable ideas through avenues of improvisation and composition. For musicians that is the symbolic level rather than being able to label features of the notational system or discourse on the relationship of the tonic chord to the Dominant XYZ.

2. Bruner's concept theory, while being a developmental theory, is experience-based rather than age-based. This assertion supports what any music teacher of students of various ages knows – that the level of conceptualization at which students enter the classroom is directly related to the amount of experience they have had with music, not their age. By experience with music we mean experiences where music was the context of the learning experience, not simply a component in a thicket of conflicting stimuli. Anyone who has attempted to teach music in a middle school where there has been no consistent instruction in the preceding elementary grades or has worked with classroom teachers in required college methods classes recognizes the truth of this aspect of Bruner's theory. Without appropriate experiences, concepts will not be developed, or, equally important to keep in mind, false concepts may be acquired.

3. Finally, as a developmentalist, Bruner recognizes that all concepts, regardless of the individual's age, are first gained at the enactive level and then, depending on additional experience and the nature of the concept, may come to be represented iconically and symbolically. Granted, possession of similar concepts and possession of the cognitive skills essential to concept acquisition will make it possible for the average adult to grasp new concepts more quickly than the five year old; but the sequence of development will always be from enactive to iconic to symbolic.

The implications for consideration

of this component when planning instruction are clear. The first task of the teacher is to ascertain the students' current levels of conceptualization (keeping in mind that all children in the same classroom will not necessarily be at the same level). Once that is known, the task becomes one of providing appropriate experiences to enable the children to begin a learning experience by participating in musical activities that are at their current level of conceptualization and then gradually introducing experiences that will help them move into the next mode of knowledge representation.

At the enactive level the teacher will keep in mind that the instruction to the child will be to "show me" rather than "tell me." It is also essential at this stage to recall that children learn appropriate enactive representation by observing a model. The teacher must always be a good model, whether moving to music, performing, or engaging in such seemingly irrelevant acts as talking while the music is playing. ("If teacher engages in this behavior, it must be appropriate for me to do so also!") It is also important to remember that the action must be appropriate in the sense that it must "feel like" the concept means. Raising one's hand at the end of a phrase serves as an iconic signal, but doesn't "feel like" music coming to a momentary pause; moving that hand in an arc which lasts for the length of the phrase does "feel like" that phrase moving through time.

To help children move into the iconic mode of knowledge representation the teacher will make use of verbal and visual icons (aural and visual images that "look/sound" like the concept) to help children internalize the musical structure. It is important to understand that these icons are instructional devices. Our goal as teachers is for children to gain the mental image. Verbal imagery will make use of appropriate but non-technical terminology – metaphors and analogies drawing on concepts children already possess. Terms such as longer and shorter in relation to durations are iconic; quarter note and half note are symbolic. Visual representations that "look like the concept means" will be used frequently to help children make appropriate associations of length, direction, similarity-contrast, and so on.

The generative approach is based on the deep conviction that this stage is the "missing link" in most approaches to music learning. The reason that most children do not reach the symbolic mode as a result of general music experiences, and that so many children "give up" on instrumental music lessons, is that teachers do not consciously plan for guiding students through this important stage in concept development. If this internalization fails to occur, the individual will never reach the symbolic level, for symbols "remind us of sound." Without the iconic mode, the internalization of concepts of musical organization, symbols remain "Greek;" they continue to be the meaningless squiggles that they are until some group has agreed to assign meaning to each squiggle. These symbols continue to be meaningless to those who have not been initiated into that group who has chosen to assign, for example this squiggle () to stand for a single duration and this one () to represent a duration that is twice as long as the first.

It is essential that the teacher recognize the crucial nature of the iconic mode and be patient. Too often we feel that we're not teaching "music" if the child is not looking at notation. However, by putting the musical score in front of the child too soon, we are probably developing habits of non-attention that will continue throughout that individual's life. Symbols must be introduced gradually, and only after the child has demonstrated the ability to associate musical sound with icons.

Finally, it is important for the generative teacher to keep in mind that every concept moves through the three modes. Just because the fifth grader has achieved the ability to sightread simple melodies and rhythms, thereby demonstrating achievement at the symbolic level of certain basic concepts, we cannot assume that all rhythmic and melodic structures should be presented symbolically. That fifth grader is probably still at the enactive level for complex metric groupings and at the iconic level for music which includes intricate combinations of durations within the rhythm of the melody. The enactive-iconic-symbolic sequence is cyclical as well as sequential; for every concept the learner must be taken through all three stages, regardless of age!

Cognitive Skill

The fifth dimension of the generative instructional model has to do with "learning how to learn" – helping children learn how to engage in critical and creative thinking processes, to solve problems, discover solutions, move from the known through the unknown to a new known. Successful solutions, whether critical or creative, will be dependent upon the selection and execution of the thinking skill(s) appropriate to the task at hand. Within the music learning environment, these choices will be dependent upon the objective of the lesson (the "new known") and on the interaction of the other components.

Thinking skills might be characterized as "low level," "middle level," and "high level," with the difference depending upon the number of components that change as we move through

the known-unknown-new known chain. For example, a class might begin with the following activity, defined by the designation of each component:

Context
Pavane

Concept Area
Expression

Behavior
Describe: Move

Mode
Enactive

Since all components of the activity are assumably familiar, the required thinking skills are low-level ones: attend and recall. After children have heard the music and moved, the teacher may comment upon successful representations and suggest that the activity be repeated to be sure that each child has decided the movements they wish to use to show the expressive qualities of the music. Once again, the skill is low-level – that of reinforcement. Following this repetition, suggestions for improvement might be demonstrated (modelling by teacher or student) and, with all components still remaining the same, the refinement is called for.

These are all low-level, partially because no new material is introduced. As the learning sequence unfolds, one or two components may be changed at a time. Depending on which components are changed, a different "middle level" thinking skill is required. For example:

Component Changed	Thinking Skill Required
Behavior Category (i.e. from Describe to Perform)	transfer
Context (different musical example)	apply
Concept (focus on different element within same context)	diverge
Mode (move from enactive to iconic, or iconic to symbolic)	represent

"High level" thinking skills may be required when several components change at the same time, as when children are asked to analyze or synthesize. Another occasion for high-level thinking might involve keeping all components the same but asking children to consider these components in a different way, as when evaluating a performing activity just completed.

In planning the instructional activity, the teacher will need to carefully consider how to structure the situation to ensure that the children engage in the appropriate thinking skill. This will be dependent, in part, on how the teacher sets up the problem through giving instructions, asking questions, or modelling appropriate behavior. Sadly, the "easiest" thinking skills to encourage are those requiring low-level responses. However, if our goal is to help children become musically independent, we must, as with the other components, make sure we are providing balance: sometimes asking for low-level responses, sometimes encouraging middle-level thinking skills, and frequently challenging students with situations that require higher-level thinking strategies.

Attitudinal Climate

The final component of the learning environment—last, but definitely not least—is that related to the attitudinal climate of the learning environment. Certainly, none of the careful planning I undertake as a teacher will result in a successful learning experience for my students if I have not constantly made choices in reference to the emotional milieu of the learning environment. It is my personal conviction that if I have made careful decisions based on the principles elucidated in the discussion of the other components, a positive attitudinal climate will be pervasive. If this component is constantly kept in mind as I plan each lesson, I can be assured that the attitudes about music and learning I hope to help children acquire – the expressive/aesthetic values, the positive concept of self, the delight in the process of music making – will thrive. For ultimately the heart of music learning, and thereby music instruction, lies there, in the delight, on the part of the child, of discovering personal meaning in music making and the exultation on the part of the teacher that the students have indeed attained the goal of musical independence, and you have become obsolete!

Footnotes

[1]One example of a concept bank may be found in Meske, Eunice, et al, 1988. *Holt Music,* Teacher's Resource Book (1-8). New York: Holt, Rinehart and Winston.

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For a more complete list of readings, see the list of references at the end of Part I, *General Music Today,* Volume 2, Number 1, p. 30.

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The Generative Theory of Musical Learning

Part III: Planning for Learning

by Eunice Boardman

Based on an address presented at the Music Educators National Conference National In-Service Conference, Indianapolis, April 20-23, 1988. Parts I and II appeared in the preceding issues, Fall and Winter, of this journal.

The key that finally opens the door to successful classroom instruction, regardless of the underlying approach or specific methodology used, is to be found in the planning that must precede each classroom experience. Only to the extent that the teacher consciously determines objectives, structures sequence, and formulates strategies that are generative will the lesson empower the learner to learn – to move *from* a known *through* an unknown *to* a new known. In the first two parts of this discussion of the generative theory of musical learning, a set of underlying assumptions and basic axioms was presented and the components of an optimum learning environment were defined. To many readers, this discussion and analysis may have seemed highly theoretical, with the question, "What does this have to do with Monday morning?" frequently recurring. Yet only to the extent that those underlying assumptions influence each decision made as next Monday morning's lesson is planned will that lesson be truly successful.

The crucial word in the previous paragraph is *plan*. The experienced teacher may be able to teach an effective lesson with a written plan that merely identifies page numbers and the name of the element to be stressed or the objective to be achieved by the end of the class period. That lesson will be effective, however, only if those jottings are simply an overt reminder for that teacher of the decisions made as to objective-sequence-strategy during the planning process.

Planning can be thought of as answering a series of questions, with the answer to be found in the fundamental assumptions about learning and teaching which form one's instructional philosophy (as offered in Parts I and II in this series of articles). One set of answers to these questions may be found in the Sample Lesson at the end of this article.

I. Toward what objective should the class be progressing?

The answer to this first question lies in the assumption that "learning moves *from* the known *through* the unknown *to a* new known." Objectives such as "will learn to sing a song," "to play the autoharp," "to enjoy hearing *Carnival of the Animals*" are not useful, for they do not tell what aspects of the actions (sing, play, hear) will require new knowledge. To state an objective that can serve as a guide for the lesson sequence, the teacher must move back and forth between recall of children's current accomplishments and consideration of what they should therefore be ready to learn. Such analysis must focus on the interdependence of the various components:

What *concepts* do these children currently possess?
Demonstrated in which *mode* of knowledge representation?
When engaging in which *behavior*?
While attending to what musical *context*?

Appraisal of the children's current level of accomplishments requires review of past lesson plans to see that the children have been involved in experiences which helped them grow in all areas of musical concepts, while engaging in a variety of behaviors, at the most appropriate mode of knowledge representation, using music drawn from diverse sources. Only such constant reappraisal will ensure that we are not falling into the trap of emphasizing one area of musical learning to the neglect of others.

As this analysis continues, the answer to the question, "Toward what new known should the class be moving?" begins to emerge. This answer must be defined as an interaction of the components. In the generative approach there might be any of a variety of combinations of those components. For example, in the Sample Lesson, the objective (achievement of the new known) is for the child to expand understanding of particular concepts into the symbolic level. The concepts (aspects of rhythm and melody) and behavior are familiar; the "new known" is in the mode of knowledge representation.

In other cases, the objective might be to gain a new concept while behaviors and modes remain constant; or the goal might be to help the child use familiar concepts to gain a competency in the execution of a particular musical skill or behavior. In all cases, the children will demonstrate attainment of the objective within a musical context – by interacting with a "real" piece of music.

Whatever the new known, the potential for generating that new learning must exist within the known the child already possesses. The objective stated in the sample lesson will not be reached if the children cannot draw on the appropriate concepts at the iconic level while engaging in the musical behaviors of performing and describing.

II. What sequence of activities will help the learner reach the objective I've established?

Determination of the objective is only the beginning of lesson planning (although a particularly important part, for it will control the answers to all subsequent questions). Part of the answer to the second question is to be found in the principle, "The whole is greater than its parts." The lesson must

be organized as a single seamless totality, a chain that allows the learner to move smoothly toward the objective because each link in that chain is securely joined to the one that comes before and the one that will come after.

A. How should the class begin?

The class should begin with an activity that forges a link to the past, with all, or most, components already known. Or, to use another metaphor, the opening activity should form the "launching pad" for the journey on which children are about to embark in their search for a new known. By engaging in an experience that is known, which provides a "threshold of safety," a positive attitudinal climate (the sixth component) will be established for each child: "Participating in music class is a personally satisfying experience;" "Learning music is an exciting experience;" "Interacting with music is a meaningful (aesthetic) experience!"

In the Sample Lesson, the first activity is a favorite of the children, one that they have repeated (with variations) several times over a period of several weeks. Thus the teacher's verbal instructions can be kept to a minimum, avoiding any interruption of the musical experience. The children are absorbed in a *musical* experience from the moment they enter the classroom.

B. How should the lesson proceed?

Learning–like music–like all experience–is holistic. Learning-music-experience is also temporal, occurring through time. For meaning to arise out of any learning experience, the learner must sense the ties among past, present, and future. That is what planning is all about–designing a learning sequence that will allow the learner to generate new learning. This generative nature of learning will occur if the learner can perceive the link between what has gone before with what is happening at the moment and thereby begin to control what may lie ahead.

To enable the learner to generate new learning, the teacher must make sure that, as the lesson unfolds, there are always familiar components to provide continuity, to continue that "threshold of safety" provided by the familiar nature of the opening activity. A lesson cannot progress by "bumps and jerks" from one isolated event to another–so many minutes of rhythms, so many minutes of singing favorite songs, so many minutes of "theory." The lesson must be designed so that each phase is securely connected to the next by strands consisting of familiar components weaving through the experience like threads in a tapestry. A single "new" introduced into this tapestry will not weaken the whole because it is surrounded by a solid web of "knowns." The new strand will easily be absorbed into the whole, altering but not breaking it.

When a learning experience consists of this web of the familiar and the unfamiliar, the learner is able to generate new learning by moving gradually, securely, meaningfully, through the total experience. The Sample Lesson provides one example of the application of this principle of lesson sequencing. The choices of which components to keep and which to change as the lesson proceeds are determined by the unknowns which must be conquered if the learner is to meet the objective.[1]

1. The originator of the concept of building a lesson sequence by altering one component at a time is Professor Betty Welsbacher, Wichita State University. She devised it when working with special education children; what works for the special child works for the "normal."

The development of a holistic sequence as just described is, of course, the heart of effective planning. Determination of the objective is a crucial first step, because one must know one's destination before embarking on a trip. We can reach that destination, however, only if the route is clearly marked. If, for example, the objective for the day is to "demonstrate understanding of rhythmic relationships by reading a new song, 'Bingo,' from notation," and the lesson plan begins with "Have the class open their books to page 22 and chant the rhythm of 'Bingo,'" we are expecting the children to complete the trip with no travel time allowed! If they can indeed accomplish that first step without negotiating a series of unknowns, then this lesson wasn't needed! No new learning has been generated, no new processes for generating knowledge have been practiced. What is more likely to happen in such a situation is that there will need to be many detours (none of which were marked on the map) because the class is not able to chant the rhythm. Since the teacher has not analyzed the problem and planned the route, the flow of the lesson will constantly bog down; confusion will abound and attitudes toward musical learning will become increasingly negative.

III. How can I be sure that the learner grasps the connections between succeeding lesson segments?

To answer this final question, the teacher must carefully consider the cognitive skills the learner will need to use to recognize the link between what has gone before and what is required at each point in the lesson. The choice of cognitive skill is influenced by the choice of the component(s) that is to be changed. Selection of the specific cognitive skill to be used then affects the choice of instructional strategy – the questions to be asked, the instructions to be given, the actions to be modelled. If the children need to *recall* what has gone before, then the instructions the teacher gives must convey that need. If they are to *translate* the knowledge gained when describing "how the music feels" through movement to visual description by drawing a picture, then the questions and instructions the teacher verbalizes must specify that the picture should "look like" the movement. Only to the extent that these strategies are carefully designed can we expect the child to attend to the pertinent aspect of the experience and be aware of the cognitive strategy he or she should use in order to move successfully through the lesson.

If, for example, we have determined, when specifying a particular segment of the lesson, that the needed cognitive skill is to *transfer* understanding gained while verbally describing the form of a composition just heard to composing music in that same form, the instructions/questions need to be posed in such a way that the series of necessary thinking acts is readily apparent. It is not enough to say, "Compose a piece that has the same form as the rondo we just heard." The children must be helped to "learn how to learn"–to discover how the knowledge they have just demonstrated they possess (by correctly describing the form) can be employed to solve the new problem. The instructional strategy employed by the teacher to guide the children might take the form of questions:

"How can you decide the number of sections you will need?" "What information do you have (can you locate) that will help you determine how many *different* sections need to be arranged? If you're not sure, what might you do to find out?"

Notice that the answers to the questions are not dependent solely on recall, although it would be possible to draw on memory of the preceding activity to answer each. Imbedded in each question is another one which focuses on *process* rather than on fact. Thus the child is constantly reminded that learning involves "thinking," using specific cognitive skills and not simply parroting back memorized answers.

Even very young children can begin to be aware of the need for "thinking," for "learning to learn." Perhaps it is simply recognition of the need (and the possibility) to *apply* familiar concepts, behaviors and modes of knowledge representation to a new context. "When we moved to 'March of the Siamese Children' we sometimes clapped, sometimes patted our heads, sometimes touched our knees to show the shortest sound. (Model while speaking.) Here is a new march. Listen for the shortest sound, then show me that you hear it. Will you use one of the movements we used when moving to 'March of the Siamese Children'? Perhaps you will think of a different way to show the shortest sound!"

As noted previously, the type of questions asked, instructions given, or actions modelled by the teacher will be shaped by the component that is changed, because it is the choice of new component that determines the cognitive skill required to turn an unknown into a known. While one could argue that the cognitive skills called for are different from those suggested in the following examples, these have been chosen because each term suggests a thinking act. Each term serves as a guide to help the teacher when thinking through the specific instructions/questions which make up the instructional strategy.

The following series of examples illustrates how the teacher's strategy will influence the children's use of a particular cognitive skill. Note that it is the *movement* from one lesson segment to the next, as delineated by the change of one or more components, that governs the choice of cognitive skill and thus the shape of the instructional strategy.[2]

The first three examples call for the use of low-level thinking skills. In the first situation the purpose is simply to remind children of the need to draw on their memories, to *recall* knowledge learned previously. In the second example, emphasis is on *reinforcement*–on helping the child "practice" remembering so that the knowledge will be available for future recall. The third instruction focuses on *refinement*–on the need to repeat something in order to improve it in some way or to perfect it. All of these are cognitive skills that musicians use frequently. They will help the learner become an independent musician, however, only if these basic skills are used in combination with higher level skills.

Example 1

CONTEXT	CONTENT	BEHAVIOR	MODE	COGNITIVE SKILL
Dance of the Comedians	Expressive	Describe/ Movement	Enactive	Recall

"At the end of our last class you used such lovely expressive movements to reflect the mood of the *Comedians' Dance*. Do you remember what you did so that you can do it again?

Example 2

CONTEXT	CONTENT	BEHAVIOR	MODE	COGNITIVE SKILL
Dance of the Comedians	Expressive	Describe/ Movement	Enactive	Recall
Same	Same	Same	Same	Reinforce

"I saw some very nice movements that really looked like comedians dancing and showed what was happening in the music. Can you do it one more time, to make sure you'll be able to remember your plan?"

Example 3

CONTEXT	CONTENT	BEHAVIOR	MODE	COGNITIVE SKILL
Dance of the Comedians	Expressive	Describe/ Movement	Enactive	Reinforce
Same	Same	Same	Same	Refine

"I saw people doing some interesting comedians who changed their 'acts' to show the difference between the exciting and calm sections of the music. This time, see if you can listen carefully and make sure your changes occur exactly at the same time as the change appears in the music."

The next five examples illustrate instructional strategies designed to challenge children to make use of more sophisticated, middle level cognitive skills. (Note that in some cases only one or a few children will be actually engaged in the specified cognitive skill. That is the price one has to pay for the limited time devoted to music class, where all must be taught in large classes and thereby have to "take turns" to learn!)

Example 4

CONTEXT	CONTENT	BEHAVIOR	MODE	COGNITIVE SKILL
"Mary Mack"	Melody	Perform/ Sing	Enactive	Recall
Same	Same	Perform/ Play	Same	Translate

"You sang that song very nicely! You knew just when to make your voices go up and down. Who could come and figure out how to play that same up-down melody on the bells? We will all sing the melody to help Juan know when he should play up and when he should play down."

Example 5

CONTEXT	CONTENT	BEHAVIOR	MODE	COGNITIVE SKILL
"Mary Mack"	Melody	Perform/ Sing	Enactive	Recall
Same	Same	Describe/ Move	Same	Transfer

"You sang that song so nicely! You showed me that you know when to make your voices go up and down. This time as you sing it, can you show me with your hands when the melody goes up and down, like this?" (Model appropriate movement.)

2. Examples drawn from: Eunice Boardman & Mary Pautz, "The Generative Approach to Music Learning," from *Educational Video Series* (Department of Continuing Education in the Arts, Division of University Outreach, University of Wisconsin-Madison, Madison, WI, 1989.)

Example 6

CONTEXT	CONTENT	BEHAVIOR	MODE	COGNITIVE SKILL
"Music Man"	Melody	Perform/ Sing	Iconic	Recall
"Duck-lings"	Same	Same	Same	Apply

"You traced the up-down shape of 'Music Man' so well as you sang the melody! I'm glad to know that you remembered how to figure out a melody by following its picture. Here is a new song. What did you learn about how to figure out melodies when you learned 'Music Man' that will help you learn this new song? Can you sing it by following the up-down picture? Here is the starting pitch."

Example7

CONTEXT	CONTENT	BEHAVIOR	MODE	COGNITIVE SKILL
"Taffy"	Melody	Perform/ Sing	Iconic	Recall
Same	Same	Same	Symbolic	Expand

"You learned to sing 'Taffy' by following its picture; here is a different way to show the ups and downs, with notes on a staff. Can you follow this new picture as you sing your familiar song? You'll have to touch each note head as you sing to find out when the melody moves up or down."

Example 8

CONTEXT	CONTENT	BEHAVIOR	MODE	COGNITIVE SKILL
Surprise Symphony Same	Melody Form	Describe/ Verbal Same	Iconic Form	Apply Diverge

"Now that we have listened to the first theme of the *Surprise Symphony* and have arranged the charts in the correct order to show the melody, I have a new task for you. This time I'm going to play a longer section of this composition. Your task is to decide whether or not that theme is repeated. If so, is it repeated immediately, or do you hear it return after other melodies are played?"

The final four examples illustrate ways of challenging children to make use of high-level cognitive skills which require drawing on previous information and combining it in new ways. In this series of examples, the skill required is not so much a function of the components that are changed (it could be one, none, or several) as it is of the type of instructional strategy the teacher uses to focus the students' attention and guide them in their thinking process.

In Example 9, the children are being encouraged to *extend* their awareness of the music, to listen with greater attention, to be more sensitive to details. In Example 10, the challenge is to draw on a variety of knowledge, gained as a result of many experiences, and to *synthesize* that knowledge into a new whole–at least new for the particular learner engaged in the task. In the eleventh example, the task is just the opposite: it requires taking a musical whole (or a musical task) apart by *analyzing* the whole into its parts in order to solve a particular problem. The final example requires the children to engage in another complex skill, that of *evaluation*. It may, like the other high-level skills, involve many subsidiary skills as the students attend, transfer, apply, synthesize or analyze in order to decide the value of that which is being evaluated.

Example 9

CONTEXT	CONTENT	BEHAVIOR	MODE	COGNITIVE SKILL
Surprise Symphony Same	Form Same	Describe/ Verbal Same	Iconic Same	Apply Extend

"We had some disagreement as to how many times we heard that same melody! I think one of the reasons was because the melody didn't always sound exactly like the one we showed with the charts. After listening again, can you tell me the differences you found? Or could you draw a design that would show those differences?"

Example10

CONTEXT	CONTENT	BEHAVIOR	MODE	COGNITIVE SKILL
Surprise Symphony Own sounds	Form Same	Describe/ Verbal Create	Iconic Same	Recall Synthesize

Provide multiple sets of mallet instruments (enough so that no more than three children must work with a single set at once) and a selection of other percussion instruments. "We found that the composer varied the melody by putting it in minor, by changing the rhythm as well as adding sounds of other instruments. Your task is to create a new variation. Begin by deciding what you will vary. Will it be one of the elements Haydn varied, or a different one?"

Example 11

CONTEXT	CONTENT	BEHAVIOR	MODE	COGNITIVE SKILL
"Shaker Tune"	Melody/ Rhythm	Perform/ Sing	Symbolic	Transfer
"Once"	Same	Same	Same	Analyze

"You did a good job of independently learning to sing 'Shaker Tune' by following the notation. Can you analyze the steps you went through and then follow those same steps to learn this new song, 'Once'?" Guide students to create a list of steps; then undertake each in order to learn the new song.

Example 12

CONTEXT	CONTENT	BEHAVIOR	MODE	COGNITIVE SKILL
Own sounds	Form	Create	Iconic	Synthesize
Same	Same	Describe/ Verbal	Same	Evaluate

"Your assignment was to create a variation on the melody Haydn used for the *Surprise Symphony*. Members of each group will introduce their variations by telling the class what they varied: the melody, rhythm, accompaniment, or some other element. As they play their variation, listeners must evaluate it. Did they do what they said they were going to do? Do you have any suggestions for ways in which they might improve their composition or its performance?"

The examples just given were fragments drawn from complete lessons. The Sample Lesson shows the sequence for a complete lesson. It was not designed simply as an illustration for this article; it was prepared for and engaged in by a class of second graders whom I have been teaching since they started first grade. I am happy to report that the lesson was a success and that these second graders are moving smoothly into the symbolic mode of knowledge representation.

Few teachers have the time to write out a complete script as elaborate as this for every lesson they teach. The value of preparing some plans in such detail is that it provides practice in sequencing–building connections–and in the art of giving instructions, asking questions, providing models. Like any skill required for the successful execution of any art form, with practice comes the ability to "perform"–to teach–without planning every infinitesimal aspect every time. Some aspects will become habitual, automatic. Teachers who do take the time to practice in order to become skilled strategists will be rewarded with lessons that move smoothly, with classes that do indeed attain objectives, with children who enter enthusiastically into the musical experience.

Even with the best of planning, every lesson may not turn out exactly as predicted; children have a way of taking even the most expert of teachers on detours. But that is part of the excitement of the generative approach. When teaching is based on recognition that learning is generative, the open-ended nature of the learning experience can be acknowledged. Such open-endedness encourages the learner to take control of his or her own learning environment. And, after all, that is what we want, isn't it? It is if we accept the thesis that

The learner's goal is independence–
The teacher's goal must be obsolescence!

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SAMPLE LESSON

LESSON PLAN: St James 2
February 15, 1989

Concepts: Individual sounds and silences within a rhythmic line may be longer, shorter or the same as other sounds within the line. A series of pitches may move up or down by steps or skips.

Context (Music)
Animal Crackers In My Soup
The Animal Song
Staines Morris Dance

Materials
Recording HMI-4 & 7
Pupil's books (p. 48)
Soup bowl charts and "animal crackers"
Magnetic board and notes
Blank strips of oaktag

Known
Learns rhythms moving in 2-1, 4-1 reading new song from notation
Learns melodies by following scale numbers (stepwise, skips of tonic)

New Known
Apply understanding of rhythmic relationships by reading new song from notation
Describe melodic movement as up-down-step-skip when represented on staff

CONTEXT	CONTENT	BEHAVIOR	MODE	COG SKILL
Ani. Cra.	Rhythm	Des/Vis	Ionic	Recall
Same	Same	Create	Same	Transfer

STRATEGY

Begin recording of *Animal Crackers*; hand each child an "an animal cracker," motioning to put in correct soup bowl displayed on magnetic board. When all in place, look at each set.
"Did we put each cracker in the right bowl?"
"Who would like to choose four animal crackers and arrange them to make an interesting accompaniment for our song? Will you choose all the crackers from the same bowl or different ones? Will your pattern end with a long or short sound?"

(SAMPLE LESSON cont'd)

Same	Same	Perform	Same	Refine	"Let's chant and tap this new accompaniment." When class demonstrates ability to repeat pattern in steady rhythm, play record for class to accompany.
Same	Same	Des/Vis	Symbolic	Expand	"Here's a new way to show these rhythms! Instead of long and short lines, we can show rhythms with notes. Hold up single eighth note. This eighth note will stand for one short sound. How many will we need to show the rhythm on the first soup bowl? Choose child to put notes in place. "Here's another way to show those short sounds; these eighths notes have their tails tied together." Show paired eighths. "How many sets will we need to show the same rhythm?" Choose child to put notes in place. Draw attention to second bowl. "What will we need to show this rhythm? Can we use the same eighth notes? Do we need something different?" "The long sound can be shown with this note!" Continue asking similar questions until all patterns are shown with notes.
Same	Same	Perform	Same	Synthe-size	Rearrange the order of the four soup bowls. "Can you tap this rhythm as an accompaniment to our music?" Play recording as class adds rhythmic ostinato while one child conducts by touching each bowl.
Anim. Sng	Same	Same	Same	Apply	"Turn to page 48. Can you read this rhythm? How will it begin, with a short or long sound? On what word will use a long sound, a lo-ong sound." Establish shortest sound; ask children to read rhythm with short/long;then with words.
Same	Same	Des/Ver	Same	Evaluate	"What do you think? Did you notice any places where we didn't read it right? Where you weren't sure whether to make the sound short, long or lo-ng?" Guide class to correct and problems noted.
Same	Melody	Des/Ver	Same	Diverge	"Look at page 49. What do you think this picture of our song tells you? Does it still tell you when to make the sounds short or long? Does it tell you anything else about how this song will sound?"
Same	Same	Same	Same	Analyze	"How do you think the melody will begin? Will it move up-down-same? By steps or skips?" Discuss movement of entire melody.
Same	Same	Same	Same	Evaluate	"Listen to the recording; track the up-down movement by touching each note-head as you hear the song. Decide if the melody sounded as you thought it would." Play recording and discuss.
Dance	Rhythm	Des/Ver	Same	Synthe-size	"We'll learn to sing the melody next time. Listen to the Morris Dance we heard last week. We found a pattern that was repeated over and over. Can you softly chant the pattern as you listen?" Play recording; listen for words long-short-short.
Same	Same	Same/M	Same	Reinforce	"Who can show that pattern with our new notes?" Play recording again as children leave the room, stepping to the long-short-short rhythm.